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PITAC UPDATE

New Co-Chairs

In August, President Clinton appointed Raj Reddy and Irving Wladawsky-Berger as co-chairs of the President's Information Technology Advisory Committee (PITAC). Reddy and Wladawsky-Berger succeed Bill Joy and Ken Kennedy, who served as founding PITAC co-chairs from February 1997 to August 1999. Reddy is Herbert A. Simon University Professor of Computer Science and Robotics at Carnegie Mellon University; Wladawsky-Berger is General Manager, IBM Internet Division at IBM Corporation.

September 1999 Meeting

Reddy and Wladawsky-Berger presided over the PITAC's most recent meeting, where the Committee reviewed the Administration's proposed $366M Information Technology for the Twenty-first Century (IT^2) initiative and discussed PITAC plans for the coming year. Prior to this meeting, the PITAC submitted a letter to Congress reiterating the critical need for Federal funding of information technology research and development. The letter encouraged Congress to "to consider information technology a priority for federal investment in budget deliberations."

Public Policy Forum

On October 19, 1999, four PITAC members participated in Resolving the Digital Divide: Information, Access,

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Congress Appropriates Additional $236M for IT R&D

In addition to funds traditionally provided to the base High Performance Computing and Communications (HPCC) Program, Congress recently appropriated an additional $236M for multi-agency information technology (IT) research and development (R&D) in fiscal year (FY) 2000.

This increase accounted for approximately two-thirds of the Administration's proposed $366M request for increased investments in IT R&D to help expand the knowledge base in fundamental information science, advance the Nation's capabilities in cutting edge research, and train the next generation of researchers who will sustain the Information Revolution well into the 21st Century.

Five agencies received funding as part of this first step in restoring the imbalance between fundamental R&D and shorter-term, mission oriented R&D in the current Federal portfolio. These agencies include:

NSF	**$126M**
DOD	**$ 60M**
NASA	**$ 38M**
NIH	**$ 6M**
NOAA	**$ 6M**
Total	**$236M***

The new research agenda builds on previous Federal accomplishments and existing investments in HPCC and responds directly to the findings and recommendations of the Congressionally-chartered President's Information Technology Advisory Committee (PITAC), which concluded in a February 1999 report that Federal investment in IT R&D is inadequate relative to its importance to the Nation. The new investments will fund critically-needed extensions of ongoing HPCC research and expansions into entirely new research areas, as recommended by PITAC.

**Note that these numbers are subject to change based on internal agency budget decisions.*

NSF Issues Information Technology Research Solicitation

As part of its $126M increase in IT R&D funding in FY 2000, the National Science Foundation (NSF) is soliciting proposals for its Information Technology Research (ITR) program. The solicitation requests proposals for fundamental IT research, encouraging research that spans different IT and scientific applications, as well as research in the area of social, ethical and workforce issues related to IT. Pending availability of funds, a separate solicitation may be issued for a terascale computer facility for high-end science and engineering.

The purpose of the ITR program is to augment the knowledge base and workforce needed to enhance the value of IT in areas such as fundamental science and engineering, the environment, health care, and government operations. NSF encourages researchers to submit innovative research on any aspect of IT including applications areas requiring computational methods and tools beyond the current state of the art. NSF is particularly interested in multi-disciplinary and multi-institutional proposals, including proposals for collaboration with international researchers, for-profit corporations, and national laboratories. Suggested research areas include software, IT education and workforce, human-computer interface, information management, advanced computational science, scalable information

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DARPA Funds Research Focused on Translingual Information Detection, Extraction, and Summarization

In late FY 1999, DARPA announced it will award research funds to more than 25 projects focused on machine translation and algorithms for Translingual Information Detection, Extraction, and Summarization (TIDES). The TIDES program goal is to reduce dramatically the amount of time it takes to perform cross-lingual retrieval, information extraction, summarization and interpretation, and machine translation of a new language. Research from these projects will help develop the capability to retrieve, summarize, and extract tokenized information occurring in multiple languages of DoD-interest using English natural language interfaces. For more information on the TIDES program, visit *http://www.darpa.mil/ito/research/tides/.*

- Coalition TIDES
- Cross-Language Information Extraction
- Crosslingual Retrieval, Extraction, Summarization
- Empirical Multilingual Processing, hOnoring Words, Enabling Rapid Ramp-up: EMPOWER2
- Evaluation and Infrastructure Support for TIDES
- Lingwear for the Information Warrior
- Multilingual Multidocument Information Tracking and Summarization
- MUCHMORE: Multilingual Concept Hierarchies for Medical Information Organization and Retrieval
- NSA Project
- Rapidly Portable Translingual Information Extraction and Interactive Multidocument Summarization
- Resources for Multilingual Information Processing Technology
- ReWRITE: A Probabilistic Approach to Rewriting for Machine, Translation, Language, Language Generation, and Abstracting
- Robust Knowledge Discovery from Parallel Speech and Text Source
- SALAM: A Systems for Encoding Semantics Across Language and Media Boundaries
- Statistical Extraction of Linguistic Substructure and Enriched Transcription for Translingual Information Retrieval
- Statistical Models for Conversational Systems and Multilingual Context Indexing and Retrieval
- Technical Support for DARPA TIDES Program
- Tech Transition
- The Webclopedia – Targeted Delivery of Multilingual Information
- TIDES Infrastructure Support
- Tools for Rapidly Adaptable Translingual Information
- Translingual Access of Chinese Text Using English
- Translingual Coreference as the New Foundation for Information Management
- Translingual Information Access: Rapidly Retargetable Approaches for Text, Speech, and Document Images
- Translingual Information Management using Domain Ontologies
- Unified, Statistical Learning Approaches to TIDES
- XMELLT: Cross-lingual Multi-word Expression Lexicons for Language Technology

NSF Awards $6 Million to Help Minority Schools Prepare for Advanced Computer Networks

NSF announced on October 28, 1999, that it had awarded almost $6 million over four years to help institutions of higher learning serving minority communities better prepare for the next generation of information technology and computer networks. The grant will be administered by EDUCAUSE, a non-profit association whose mission is to transform education through information technologies.

Under the new program, traditionally African-American, Hispanic, and Tribal colleges and universities will develop the infrastructure and skills needed to take advantage of advanced Internet capabilities, including the Next Generation Internet. A significant barrier for many institutions has been the development of institutional technical and financial strategies and training of technical support staff. Activities under this award will engage individuals at all levels of the institutions in attacking those problems.

Furthermore, the program will allow educators and students to integrate databases, supercomputer centers, and scientific virtual reality tools into their instruction. Research faculty, through better awareness of and access to computer networks, may be able to increase their competitiveness for research grants and enhance their teaching strategies. Technical staffs will be better prepared to support and maintain the technology on a long-term basis. Also, the institutions' administrators will be better prepared for planning future information technology needs.

Regional and on-campus workshops and training programs, prototype or experimental network connections, and establishment of regional network support centers are among the tools that will be used to achieve the program's objectives. For more information about this NSF program, contact William Decker at wdecker@nsf.gov or (703) 306-1949.

NIST Researchers Developing Online Version of Math Functions Handbook

When asked by New Scientist magazine what one book he would want if stranded on a desert island, distinguished British physicist Sir Michael Berry named the Handbook of Mathematical Functions.

The book, first published by NIST in 1964, has become a classic reference work for scientists and engineers around the world. While it does not make for light reading, it contains a wealth of information about mathematical functions that aid in scientific computation and analysis in areas as diverse as astronomy, atmospheric modeling, and underwater acoustics.

NIST is launching a project to conduct an exhaustive survey of all relevant published literature on mathematical functions in order to produce a brand new compendium. The new work will be published on the Web and will be known as the Digital Library (DL) of Mathematical Functions.

NIST mathematicians and computer scientists are working on a variety of ways to make the DL especially useful in the Internet age. Advanced search engines will help scientists find the right mathematical formulas. Downloading of formulas in a variety of formats will be just a mouse click away. Guidance for the construction and testing of mathematical software, and examples of typical usage of functions in scientific fields, will be built in. Viewers will be able to use Web browsers that incorporate Virtual Reality Modeling Language to manipulate graphical representations of functions.

Some of the world's leading mathematicians -- from the United States, England, France, the Netherlands, and Austria -- are participating in the project and developing much of the core material. NIST is exercising editorial control, as well as developing and maintaining the Web site as a free public resource.

The project, funded in part by a $1.3 million grant from NSF, will take four years to complete. A mockup of the DL may be viewed on the Web at http://math.nist.gov/DigitalMathLib/.

National Library of Medicine Supports New Next Generation Internet Projects

The National Library of Medicine (NLM), part of the National Institutes of Health, recently announced eight contract awards to medical institutions and companies that will develop innovative medical projects demonstrating the application and use of Next Generation Internet (NGI) capabilities such as Quality of Service, medical data privacy and security, nomadic computing, network management, and infrastructure technology for scientific collaboration. NLM expects to make additional awards during the first quarter of FY 2000. The projects receiving the recent awards are:

- A Multicenter Clinical Trial Using NGI Technology
- An Internet2-Based Collaboration for Distributed Medical Informatics Education
- Biomedical Tele-Immersion
- Connectivity, Security, and Performance of an NGI Testbed for Medical Imaging Applications
- Indianapolis Testbed Network for NGI Applications to Telemedicine
- PathMaster: A Web-Accessible Cell Image Database Indexed by Mathematical Descriptors and Supported by Parallel Computation
- Patient-Centric Tools for Regional Collaborative Cancer Care Using NGI
- Personal Internetworked Notary and Guardian

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and Opportunity, a public policy forum to help develop a national action plan to ensure that all Americans have access to information technology and the Internet. The event, sponsored by the Joint Center for Political and Economic Studies in association with the PITAC and the Woodrow Wilson International Center for Scholars, featured representatives from government, academia, and industry interested in achieving universal access. To listen to the event online or read transcripts from individual speakers, visit *http://www.jointcenter.org/* or *http://www.ccic.gov/ac/*.

PITAC Plans

Under the leadership of Reddy and Wladawsky-Berger, the PITAC is creating new panels to address critical technologies needed to achieve the transformations outlined in the PITAC's February 1999 report to the President, entitled "Information Technology Research: Investing in Our Future." These panels will include PITAC members and invited participants from government, academia, and industry. Details about the PITAC panels will be posted at *http://www.ccic.gov/ac/* as they develop.

Grants Aid in Developing the Next Generation of Innovative Digital Library Technologies and Applications

To date, approximately 30 grants have been awarded to universities and research institutions in FY 1999 through the multi-agency Digital Libraries Initiative - Phase Two (DLI2). DLI2 builds upon the success of previous Federally-supported digital libraries (DL) research and aims (1) to extend research and testbed activities in promising DL areas; (2) accelerate development, management, and accessibility of digital content and collections; (3) create new capabilities and opportunities for DL to serve existing and new user communities; and (4) encourage the study of interactions between humans and DL in various social and organizational contexts.

DLI2 is jointly supported by NSF, DARPA, NLM, the Library of Congress, NASA, and the National Endowment for the Humanities, in partnership with the National Archives and Records Administration, the Smithsonian Institution, and the Institute of Museum and Library Sciences. FY 1999 funded projects include:

- A Digital Library for the Humanities
- A Digital Library of Vertebrate Morphology, Using High-Resolution X-ray CT
- A Distributed Information Filtering System for Digital Libraries
- Alexandria Digital Earth Prototype
- A Multimedia Digital Library of Folk Literature
- An Operational Social Science Digital Data Library
- A Patient Care Digital Library: Personalized Search and Summarization over Multimedia Information
- A Software and Data Library for Experiments, Simulations, and Archiving
- Automatic Reference Librarians for the World Wide Web
- Data Provenance
- Digital Workflow Management: The Lester S. Levy Digitized Collection of Sheet Music, Phase Two
- Founding a National Gallery of the Spoken Word
- High-Performance Digital Library Classification Systems: From Information Retrieval to Knowledge Management
- Image Filtering for Secure Distribution of Medical Information
- Informedia-II: Integrated Video Information Extraction and Synthesis for Adaptive Presentation and Summarization from Distributed Libraries
- Project Prism at Cornell University: Information Integrity in Digital Libraries
- Re-inventing Scholarly Information Dissemination and Use
- Simplifying Interactive Layout and Video Editing and Reuse
- Stanford Interlib Technologies
- The Digital Atheneum: New Techniques for Restoring, Searching, and Editing Humanities Collections
- Tracking Footprints through an Information Space: Leveraging the Document Selections of Expert Problem Solvers

For details on these and other DLI2 funded projects, visit *http://www.dli2.nsf.gov/projects.html/*.

NOAA Acquires New Supercomputer

In September, 1999, the Department of Commerce acquired one of the fastest computer systems in the world to help the National Oceanic and Atmospheric Administration (NOAA) further improve existing weather forecast models and develop entirely new ones. A $15 million contract was awarded to High Performance Technologies, Inc. (HPTi) of Reston, VA, to provide a high performance computing system to NOAA's Forecast Systems Laboratory (FSL) in Boulder, CO.

When the system is first installed, it will be running a third of a trillion arithmetic operations per second, providing 20 times more computational powerful than is currently available at FSL. By the final upgrade in 2002, the HPTi supercomputer will be processing about four TeraFLOPS of data, or four trillion arithmetic computations per second.

The supercomputer will support the development of the next generation of mesoscale models and a more accurate operational weather prediction model providing national-scale forecasts based on the latest observations on an hourly basis.

NSF's ITR Solicitation

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infrastructure, social and economic implications of IT, and revolutionary computing.

Under this solicitation, researchers may submit proposals for any amount of funding up to $3M per year for up to five years. Only proposals requesting more than $500K may request a duration of more than three years. NSF will award grants in a wide variety of sizes and durations, though the majority will be for projects not more than $1M per year. The number of awards made will depend on the quality of submissions and the availability of research funds. NSF expects to make ITR awards in September 2000.

For more information on NSF's ITR solicitation and details about proposal deadlines, preparation and submission instructions, and the merit review process, visit NSF's ITR Web site at *http://www.itr.nsf.gov/*.